

ized June 7, 1900, are 63 feet 4 inches in length, 11 feet 9 inches in diameter and have a displacement, submerged, of 120 tons. When on the surface, they are driven by a single-screw, four-cylinder, Otto gasoline engine of 160 horse power. They are provided with a generator of 70 horse power, which may be either driven by the gasoline engine for charging the batteries, or, when the boat is submerged, the generator can be thrown onto the batteries and used as a motor for driving the propeller.

These six submarines are built with a double bottom and with three watertight compartments. In the forward compartment are the gasoline tank, the expulsion tube, and the air flasks for the discharge of the torpedoes. The amidship compartment contains the main ballast tanks, which are located in the double bottom, and above them are the storage batteries, the torpedoes, and the air flasks in which fresh air for the crew is stored at 2,000 pounds pressure. In the third compartment at the stern are the gasoline engine, the motor, the clutches and the steering gear. Submersion is achieved by trimming tanks assisted by a pair of horizontal diving rudders at the stern. The vessel is controlled from a conning tower protected with four inches of armor. Considerable experience has been gained with the "Holland," which has served as a school of instruction in which crews and officers are enabled to familiarize themselves with this type of craft. The most interesting experiment thus far was the recent sinking of one of the "Hollands" to the bottom of Peconic Bay, where she remained for fifteen hours without coming to the surface. The officers and crew experienced no inconvenience whatever from vitiated atmosphere. Whether the same immunity would be realized were the batteries and motor power in operation is, of course, an open question which could only be solved by an actual trial.

Torpedo-Boats and Destroyers.

TORPEDO-BOAT "FARRAGUT."

In the matter of torpedo-boats and torpedo-boat destroyers the United States navy has been content to pursue a conservative course, rather than rush into the wholesale construction of these craft with that precipitancy which has characterized some European navies. Up to the year 1890 we did not have a single torpedo-boat in commission, and at the present time we have but thirty-five of these little vessels, all told, on our naval list; whereas there are some navies which number them by the hundred. The value of the torpedo-boat is even to-day an unsettled question, and the complete loss of the destroyers "Cobra" and "Vi-

per" during the past few months, together with the severe straining which has taken place in heavy weather of other craft of the torpedo-boat destroyer type, has reopened the question of the proper design, size and strength of torpedo craft to render them serviceable and safe upon the high seas. Hence, it is a matter of congratulation that, if we decide to increase our torpedo fleet, we have the advantage of experience gained in the maneuvers of foreign fleets; while, on the other hand, should the torpedo-boat pass out of fashion, we shall not have a large tonnage of worthless material on our hands. Our thirty-five torpedo-boats vary in size and speed

trial a speed of 30.13 knots per hour. The bunkers have a capacity of 95 tons. The armament consists of two long 18-inch Whitehead torpedo tubes and four 6-pounder rapid-fire guns. She has a complement of 66 officers and men.

Of the total thirty-five torpedo-boats in our navy twenty-three have been commissioned or completed since the close of the Spanish war.

TORPEDO-BOAT DESTROYER "PERRY."

The torpedo-boat destroyer owes its existence to the theoretical prowess of the torpedo-boat. The torpedo-boat was one of those devices which periodically figure

in the scare-head lines of the daily press as "annihilators," and the torpedo-boat destroyer is the annihilator of the annihilator. As soon as a few of the early torpedo-boats were built and began to maneuver with the fleets, it was found that they were altogether unseaworthy, at least so far as maintaining their speed in a jump of a sea was concerned. Hence, the idea of the torpedo-boat destroyer—a larger edition of the torpedo-boat, armed with heavier guns, and, by virtue of her greater speed and weight, able to run down the torpedo-boat and sink her. As the tendency in the construction of torpedo

craft, whether of the torpedo-boat or destroyer type, has always been toward increase in size, our Naval Constructors when designing the sixteen torpedo destroyers, authorized May 4, 1898, very wisely made them considerably larger than the destroyers which were being built for foreign navies. We present an illustration of the "Perry," built by the Union Iron Works, at San Francisco, which was taken when she was making one of her trial runs at full speed. The cylinders of the "Perry" are 20½, 32, 38, and 38-inch diameter by 22-inch stroke. At 327 revolutions the horse power is about 8,000. The steam at the boilers is at 300 and at the engines 250 pounds pressure. There are four Thornycroft water-tube boilers, two forward of the engines and two aft.

Nine of the destroyers are of 420 tons displacement and are designed for speeds of 28 and 29 knots with 8,000 indicated horse power. They are known as the "Bainbridge," "Barry," "Chauncey," "Dale," "Decatur," "Paul Jones," "Perry," "Preble," and "Stewart," being named after heroes whose names are associated with the most brilliant episodes of our naval history.

Each destroyer carries on the main deck two torpedo tubes for the discharge of the 18-inch Whitehead torpedo. The armament consists of two 12-pounder rapid-fire guns carried, one forward and one aft, above the conning towers and protected by shields. There are also five 6-pounders carried in broadside on the main deck. These vessels have a length of 245 feet, a beam of 23 feet 7¼ inches, and a draught of 6 feet

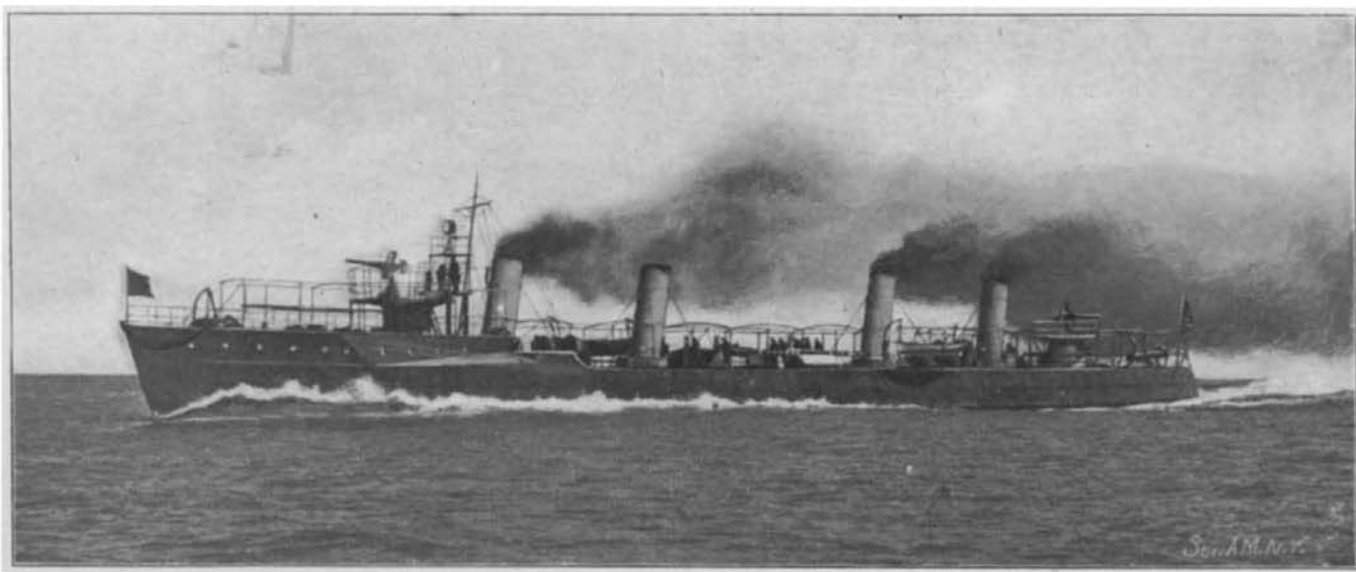


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Length, 213 feet. Beam, 20 feet 7¼ inches. Mean Draft, 6 feet. Displacement, 279 tons. Speed, 30.1 knots. Bunker Capacity, 95 tons. Armament: Two 18-inch Whitehead torpedoes; four 6-pounder R. F. guns. **Complement, 66.**

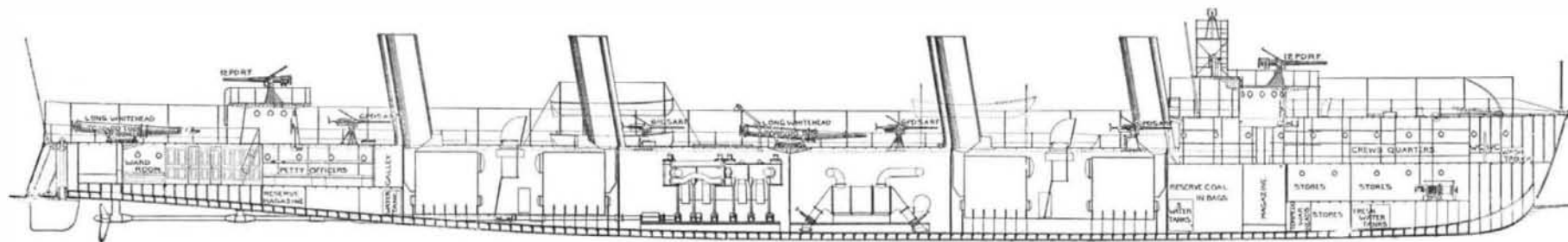
TORPEDO-BOAT "FARRAGUT."

from the "Gwin," of 46 tons and 21 knots speed, to the "Stringham," of 340 tons and 30 knots speed, and the "Bailey," "Goldsborough" and "Farragut," of 247 to 280 tons displacement and 30 knots speed. The last three craft were originally designed as torpedo-boat destroyers; but our Naval Constructors reached the conclusion that the destroyer, to be fully equal to its work, should be a larger and more powerful vessel, and consequently when the sixteen torpedo-boat destroyers of the "Bainbridge" type were designed the four vessels named above were relegated to the torpedo-boat class. As torpedo-boats they will be the largest in the world; indeed, they will exceed in size many of the destroyers in other navies. The "Farragut," which is herewith shown after her launch from the Union Iron Works, San Francisco, is typical of the larger torpedo-boats. She is 213 feet in length, 20 feet 7¼ inches in beam, and has a mean draft of 6 feet, at which draft she displaces 279 tons. She is driven by twin-screw, vertical, triple-expansion engines of 5,600 horse power, and she has made on



Length, 245 feet. Breadth, 23 feet 7¼ inches. Draft, 6 feet 6 inches. Displacement, 420 tons. Contract Speed, 29 knots. Bunker Capacity, 139 tons. Armament: Two long 18-inch Whitehead torpedo tubes; two 3-inch R. F. guns; five 6-pounders. **Complement, 73.**

TORPEDO-BOAT DESTROYER "PERRY"—"BAINBRIDGE" CLASS OF SIXTEEN VESSELS.



LONGITUDINAL SECTION, SHOWING INTERNAL ARRANGEMENTS OF TORPEDO-BOAT DESTROYERS.



COMING OUR WAY

FASTER THAN EVER

Remington
Typewriters

ARE IN GREATER DEMAND THAN EVER BEFORE.

In 1898, The sale of the REMINGTON was 25 per cent. greater than in any previous year of its history.

In 1899, REMINGTON sales exceeded those of the previous year by an even greater percentage.

In 1900, More REMINGTONS were again sold than ever before in any year of its history.

In 1901, More REMINGTONS have been sold in *eleven months* than in any entire year of its former history.

The annual sale of the REMINGTON has always been greater than that of any other typewriter—of many others combined. It is known the world over as **the most durable and reliable writing machine.**

WYCKOFF, SEAMANS & BENEDICT,
327 BROADWAY, NEW YORK.

\$80 in 6 days

is what O. W. Clement, of Colon, Mich.,
recently received

SELLING THE Turner "Little Wonder" Lamp

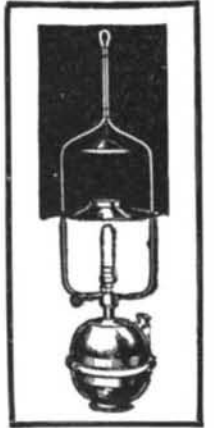
This is not an extraordinary experience at all to anyone acquainted with the remarkable merits and easily demonstratable selling qualities of this Lamp. It is what many of our other agents are doing, and some, more than that. After careful investigation it is estimated that over

500,000 GASOLINE LAMPS

were sold last season, Many more will be sold this season.

Are you not ready to pocket some of the profits? Big profits.

The "LITTLE WONDER" LAMP is the latest invention of the greatest inventor of gasoline lamps. Generates hydrocarbon gas from gasoline (wholly different from gasoline lamps). Possesses under generator pressure overcoming the hitherto impossible obstacle of combining volume of light with non-clogging feature. Used with or without glass. 500 candle power arc light costs $\frac{1}{4}$ cent per hour. This Lamp can be adapted to all interior lighting purposes. **ABSOLUTELY UNAPPROACHABLE.** Producing the **BRIGHTEST KNOWN LIGHT**, even more brilliant than electricity. There is no other lamp or light comparable with it, both in intrinsic value and selling qualities.



OUR GUARANTEE

We have been in business in Chicago 30 years. We are the largest manufacturers in our line in the world.

We back this lamp by our reputation. We agree to make good by repair or replacement at our factory within one year any part of this lamp which is proven defective in material or workmanship. The "Little Wonder" lamp was invented after many years of experience in the manufacture of lamps and after our experts had tested nearly every lamp now in the market. It is pronounced a marvel by health and insurance authorities. We unhesitatingly affirm that the "Little Wonder" is the superior of any other lamp made.

IT SELLS ITSELF. Put the Turner "Little Wonder" Light on exhibition, preferably after dark, and it positively sells itself. Everyone that looks at it is surprised at the steady, brilliant illumination which this light will give. It can be seen to be smokeless and odorless, and very handy; and when the people are told what it costs to operate it and learn of our absolute guarantee, together with its absolute safety, sales can be made at once on the spot.

WE WANT RESPONSIBLE AGENTS to whom we have a proposition to make that will afford them more money than they can possibly earn in any other manner. We want live men and are willing to pay well for them. We know that we have a wonderful invention and are willing to back it with our guarantee and the reputation of our house. If you are an enterprising man, why be content in your present position when the opportunity is yours to double your present income with the largest concern in our line in the world? **REMEMBER** we appoint but one agent in a place. Others are making hundreds of dollars a month. You can, too. We are responsible and we guarantee this lamp to be all we represent it. Don't miss this opportunity. Write to-day. Address

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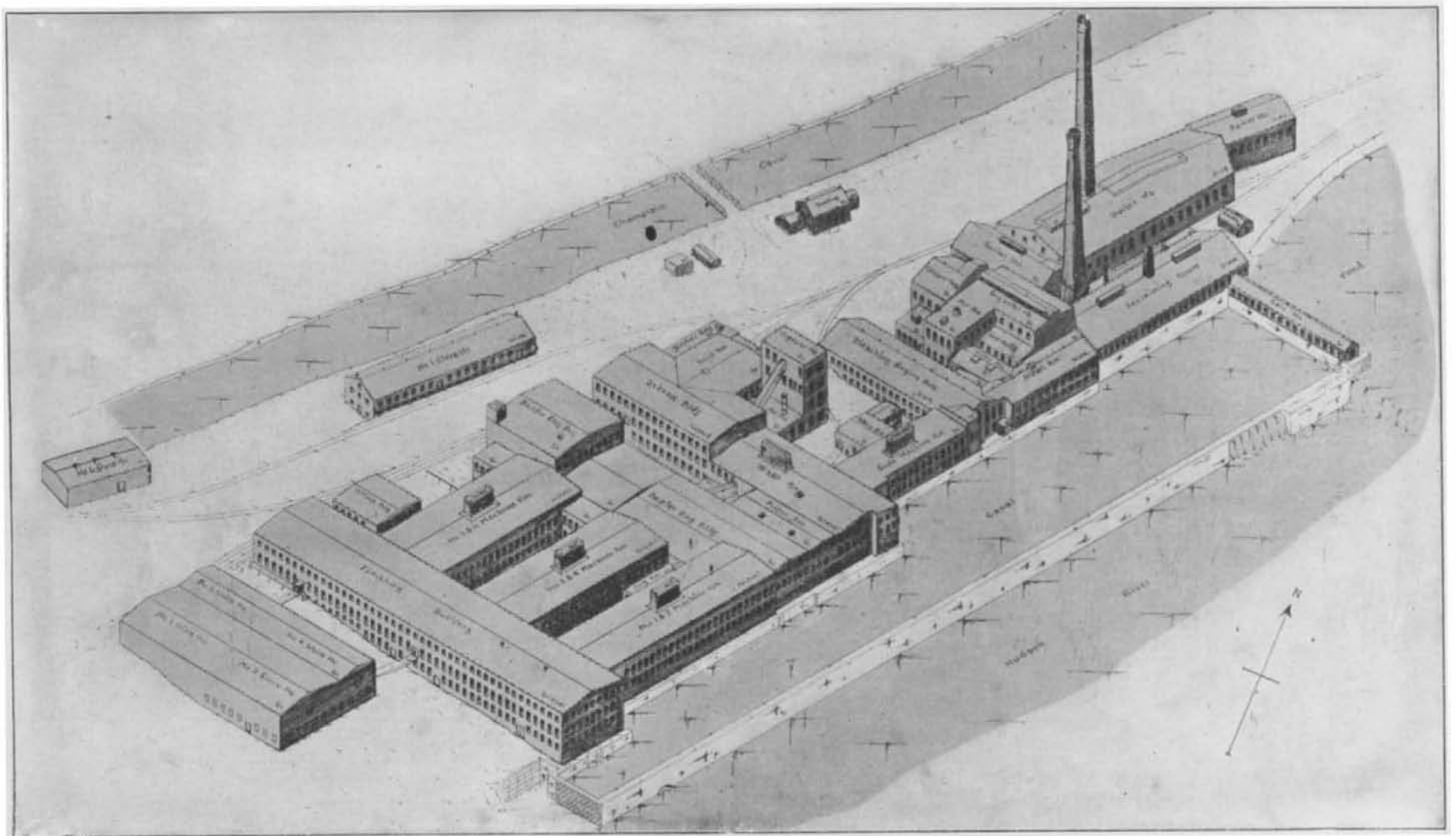
THE DUNCAN COMPANY,

Times Building, New York City.

— MANUFACTURERS OF —

MACHINE FINISHED AND SUPER-GALENDERED PAPERS.

SULPHITE AND SODA FIBRES.



GENERAL VIEW OF THE DUNCAN COMPANY'S PLANT ON THE HUDSON RIVER AT MECHANICSVILLE, N. Y.

TABLE OF VESSELS COMMISSIONED, COMPLETED, BUILDING, OR AUTHORIZED SINCE THE SPANISH WAR.
BATTLESHIPS AND ARMORED CRUISERS.

Name.	Type.	Displacement in Tons.	Speed in Knots.	Armor.		Armament.	
				Belt.	Gun Positions.	Main.	Secondary.
Kearsarge.....	Battleship.	11,540	16.8	16½ in.	17 in.—15 in.	4 13-in. B. L. R. 4 8-in. B. L. R. 14 5-in. R. F. G.	20 6-pounders. 8 1" 6 small guns.
Kentucky.....	"	"	16.9	"	"	"	"
Alabama.....	"	11,565	17.1	16½ in.	15 in.—14 in.	4 13-in. B. L. R. 14 6-in. R. F. G.	16 6-pounders. 6 1" 6 small guns.
Illinois.....	"	"	17.4	"	"	"	"
Wisconsin.....	"	"	17.2	"	"	"	"
Maine.....	"	12,300	18.0	11 in.	12 in.—12 in.	4 12-in. B. L. R. 16 6-in. R. F. G. 6 3-in. R. F. G.	8 6-pounders. 6 1" 4 small guns.
Missouri.....	"	"	"	"	"	"	"
Ohio.....	"	"	"	"	"	"	"
Georgia.....	"	14,948	19.0	11 in.	11 in.—10 in.	4 12-in. B. L. R. 8 8-in. B. L. R. 12 6-in. R. F. G. 12 3-in. R. F. G.	12 3-pounders. 8 1" 10 small guns.
Nebraska.....	"	"	"	"	"	"	"
New Jersey.....	"	"	"	"	"	"	"
Rhode Island.....	"	"	"	"	"	"	"
Virginia.....	"	"	"	"	"	"	"
Arkansas.....	Monitor.	3,235	11.5	11 in.	11 in.—10 in.	2 12-in. B. L. R. 4 4-in. R. F. G.	3 6-pounders. 6 1" 2 Colts.
Florida.....	"	"	"	"	"	"	"
Nevada.....	"	"	"	"	"	"	"
Wyoming.....	"	"	"	"	"	"	"
California.....	Armored Cruiser.	13,680	22.0	6 in.—5 in.	6½ in.—6 in.	4 8-in. B. L. R. 14 6-in. R. F. G. 18 3-in. R. F. G.	12 3-pounders. 8 1" 10 small guns.
Colorado.....	"	"	"	"	"	"	"
Maryland.....	"	"	"	"	"	"	"
Pennsylvania.....	"	"	"	"	"	"	"
South Dakota.....	"	"	"	"	"	"	"
West Virginia.....	"	"	"	"	"	"	"
Charleston.....	Semi-armored Cruiser.	9,700	22.0	4 in.	Deck 3 in.—2 in.	14 6-in. R. F. G. 18 3-in. R. F. G.	12 3-pounders. 24 small guns.
Milwaukee.....	"	"	"	"	"	"	"
St. Louis.....	"	"	"	"	"	"	"

UNARMORED CRUISERS AND GUNBOATS.

Name.	Type.	Displacement in Tons.	Speed in Knots.	Protective Deck.		Armament.	
				Slopes.	Flat.	Main.	Secondary.
Chattanooga.....	Semi-protected Cruiser.	3,200	16.5	2 in.—1 in.	½ inch.	10 5-in. R. F. G.	8 6-pounders. 6 small guns.
Cleveland.....	"	"	"	"	"	"	"
Denver.....	"	"	"	"	"	"	"
Des Moines.....	"	"	"	"	"	"	"
Galveston.....	"	"	"	"	"	"	"
Tacoma.....	"	"	"	"	"	"	"
Reina Mercedes.....	Unprotected Cruiser.	3,090	17.0	"	"	"	"
Don Juan de Austria.....	Gunboat.	1,130	14.0	"	"	4 5-in. R. F. G.	4 6-pounders. 4 Colts.
General Alava.....	"	1,390	10.5	"	"	"	"
Isla de Cuba.....	"	1,125	14.0	2½ in.	1½ inches.	4 4-in. R. F. G.	6 Nordenfelts. 4 6-pounders. 4 Colts.
Isla de Luzon.....	"	"	"	"	"	"	"
*Alvarado.....	"	106	19.0	"	"	"	4 6-pounders. 4 Colts. 2 3-pounders. 2 Colts.
† Gunboat No. 16.....	"	"	"	"	"	"	"

* Twenty-one of this type of Gunboat captured or purchased from Spain, varying from 42 to 590 tons displacement and from 8 to 19 knots speed.

† Contract not awarded.

DESTROYERS AND TORPEDO BOATS.

Name.	Type.	Displacement in Tons.	Speed in Knots.	Armament.	
				Torpedo Tubes.	Guns.
Bainbridge.....	Torpedo-boat Destroyers.	420	29.0	2 18-inch Whitehead.	2 3-inch and 5 6-pounders R. F. G.
Barry.....					
Chauncey.....					
Dale.....					
Decatur.....					
Paul Jones.....					
Perry.....					
Preble.....	Torpedo-boat Destroyers.	402	30.0	2 18-inch Whitehead.	2 3-inch and 5 6-pounders R. F. G.
Stewart.....					
Lawrence.....					
Macdonough.....					
Truxton.....					
Whipple.....					
Worden.....					
Hopkins.....	Torpedo-boat Destroyers.	408	29.0	2 18-inch Whitehead.	2 3-inch and 5 6-pounders R. F. G.
Hull.....					
Bagley.....					
Bailey.....					
Barney.....					
Biddle.....					
Blakely.....					
Davis.....	Torpedo-boat.	175	29.2	3 18-inch Whitehead.	3 3-pounders R. F. 4 6-pounders R. F. 3 3-pounders R. F.
Dahlgren.....					
De Long.....					
Farragut.....					
Fox.....					
Goldsborough.....					
MacKenzie.....					
Nicholson.....					
•Brien.....					
Rowan.....					
Shubrick.....					
Stockton.....					
Stringham.....					
T. A. M. Craven.....					
Thornton.....					
Tingey.....					
Wilkes.....					
Holland.....	Submarine.	74	8	1 Torpedo Tube.	1 Dynamite Gun. 5 45-cm. Whiteheads.
Adder.....					
Grampus.....					
Moccasin.....					
Pike.....					
Shark.....					
Porpoise.....					
Plunger.....					

6 inches. They are capable of carrying 139 tons of coal closely stowed in their bunkers, and the complement consists of four officers and sixty men. One excellent feature, which will give them considerable advantage over some of the latest boats that have been constructed for foreign navies, is that, in addition to their relatively large size, they are provided with a long forecastle deck, which gives them an extreme freeboard forward of 14 feet, the freeboard amidships be-

ing about 9 feet. This will considerably improve their speed in steaming to windward in heavy weather. Three of these vessels have been constructed by Neafie & Levy, Philadelphia; two by William R. Trigg & Company, Richmond, Va.; three, as mentioned, by the Union Iron Works, of San Francisco; and one by the Gas Engine and Power Company, Morris Heights, N. Y. The "Hopkins" and the "Hull," which are being built by the Harlan & Hollingsworth Company, Wil-

Name.	Number of Vessels.	Length.	Beam.	Draught.	Displacement, Tons.	Horse Power.	Speed, Knots.	Bunker Capacity.	Torpedo Tubes.	Armament.
Bainbridge.....	9	245	23 7½	6 6	420	8,000	29	139 2	18-in.	2 12-pdr., 5 6-pdr.
Hopkins.....	2	244	24 6	6 0	408	7,200	29	150	"	2 12-pdr., 5 6-pdr.
Lawrence.....	2	242 3	22 3	6 2½	400	8,400	30	115	"	2 12-pdr., 5 6-pdr.
Worden.....	3	248	23 3	6 0	433	8,300	30	232	"	2 12-pdr., 5 6-pdr.

ington, Del., are somewhat smaller vessels. They have about the same length, a foot more beam, and 6 inches less draught with a displacement of 408 tons. They were designed to achieve 29 knots with 7,200 indicated horse power, and the bunker capacity will be 150 tons, the armament and the complement of officers and crew being the same as for the "Bainbridge." The "Lawrence" and the "Macdonough," which are being built by the Fore River Engine Company, Weymouth, Mass., are the smallest vessels of the fleet. They are of 400 tons displacement, and they were designed to achieve a speed of 30 knots with 8,400 indicated horse power. The coal capacity is less, namely, 115 tons; particulars of the armament and the complement are the same as for the other vessels. The largest of the fleet are the "Truxton," "Whipple," and "Worden," building by the Maryland Steel Company, at Sparrows Point, Md. They are 248 feet in length, 23 feet 3 inches beam, and on a draught of 6 feet they have a displacement of 433 tons. They have the large bunker capacity of 232 tons—a very valuable feature—and they are to make a speed of 30 knots with a development of 8,300 horse power.

These destroyers cannot fail to produce a favorable impression. Their size, roominess, coal capacity, and powerful armament, and, above all, their good sea-going qualities and high speed, will place them in the very front rank of this type of vessel.

OUR RELATIVE STANDING AMONG THE NAVAL POWERS.

In the accompanying table it will be observed we have placed the United States navy in the fourth position in rank, with England first, France second, and Russia third. At first glance, when comparing the navies by the total number of ships they possess, it would seem as though Germany, with her total of 77, should take precedence over the United States with 62. It must be borne in mind, however, that the truest test of naval strength lies in a comparison of the total displacement and a consideration of the distribution of that displacement among the various types of warships which it represents. Judged by these two tests we hold a remarkable lead over Germany. Thus the 77 German ships represent a total displacement of 395,858 tons, whereas the 62 ships of the United States Navy total up 474,179 tons, an excess of 78,321 tons. The fighting strength of a navy lies in its line of battle; that is in the first-class battleships and armored cruisers that can match armor with armor, heavy gun with heavy gun. Here our superiority is overwhelming, for we can put in line 28 armored ships of 339,444 tons total displacement against Germany's 20 first-class armored ships of 215,254 tons total. Not only so, but ship for ship our 15,000-ton "Georgias" entirely outclass the 12,000-ton German "Wittelsbachs," and our 14,000-ton armored cruisers of the "Pennsylvania" class have an equal superiority to the 9,000-ton "Prinz Heinrich" class.

COMPARATIVE TABLE OF OUR OWN AND FOREIGN NAVIES.

Total Number of Ships Built or Building as per Brassey's Annual, 1901.

Class.	Great Britain	France	Russia	United States	Germany	Italy	Japan
Battleships.							
1st Class.....	38	13	14	17	16	9	6
2nd Class.....	11	10	10	—	—	5	—
3d Class.....	10	11	1	1	7	2	1
Total.....	59	34	5	18	23	16	7
Cruisers.							
1st Class.....	43	19	13	13	5	5	6
2nd Class.....	62	23	7	16	8	5	10
3d Class.....	44	13	5	5	18	11	6
Total.....	149	55	25	34	31	21	22
Coast Defense Vessels.	17	14	16	10	19	3	1
Torpedo Gunboats.	34	21	9	—	4	17	2
Total Number of War-ships.....	259	124	75	62	77	57	32